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10/627,607	07/28/2003	Makoto Onodera	62758-047	4276

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EXAMINER

OCHOA, JUAN CARLOS

ART UNIT	PAPER NUMBER
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2123

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/627,607

Applicant(s)

ONODERA ET AL.

Examiner

Juan C. Ochoa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/3/07</u> . | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. The amendment filed 1/3/07 has been received and considered. Claims 1–6 are presented for examination.

### ***Specification***

2. The disclosure is objected to because of the following informalities:
3. Page 4, lines 8–10 includes the phrase ““With this, it is possible to obtain the apparatus, being able to produce the analytical shell-model, easily, and as to be the configuration model, as well”. Meaning is unclear.
4. Appropriate correction is required.

### ***Claim Objections***

5. Claims 2, 3, and 6 are objected to because of the following informalities:
6. Claim 2, line 3 refers to “plate thickness”, if this refers to “reference-plate thickness”, would be better as “reference-plate thickness” to avoid any possible antecedent issues.
7. Claim 2, line 3 refers to “said pair”, if this refers to “said pair of surfaces”, would be better as “said pair of surfaces” to avoid any possible antecedent issues.
8. Claim 3 page 6, lines 7 and 8 refer to “acknowledging the pair-surfaces acknowledged by”, meaning is unclear. Examiner interprets as “acknowledging the two (2) surfaces” for examination purposes.

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9. Claim 6 page 7, line 12 refers to "distance between two (2) surfaces of the pair", meaning is unclear. Examiner interprets as "distance between the two (2) surfaces" for examination purposes.

10. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1–6 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.

13. Specifically, in claims 1 and 3, the omitted elements are: elements to produce an analytical shell-model as set forth in the claims preambles. Examiner interprets "an internal-surface model" as "an analytical shell-model", as set forth in the claims preamble, for examination purposes.

14. Claim 3 recites the limitation "arbitrary two (2) surfaces" in page 24, lines 30 and 31. There is insufficient antecedent basis for this limitation in the claim. Examiner interprets as "the two (2) surfaces" for examination purposes.

15. Dependent claims inherit the defect of the claim from which they depend.

***Claim Rejections - 35 USC § 101***

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16. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

17. Claims 1–6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

18. Specifically, claims 1 and 3 recite software limitations and therefore the claims are directed to software per se, which are considered non-statutory subject matter.

Furthermore, claims recite apparatuses that are not tangibly embodied. The claimed apparatuses lack hardware to enable the functionality of the software limitations to be realized.

19. Specifically, claims 1 and 3 do not produce a useful, concrete and tangible result. The claim, not being capable of imparting functionality, fails to reflect any described practical utility. Thus, there would be no "useful" result upon execution. No tangible result claimed, only an abstract idea. No "analytical shell-model" claimed.

20. Specifically, claim 3 does not produce a useful, concrete and tangible result. The claim, not being capable of imparting functionality, fails to reflect any described practical utility. Thus, there would be no "useful" result upon execution. No tangible result claimed, only an abstract idea. Furthermore, the limitation "an internal-surface producing means for registering the offset-surface seamed by said seam-surface producing means, as in a form of an internal-surface model" reflects intended use and it does not actually produce an internal-surface model.

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21. Dependent claims inherit the defect of the claim from which they depend.

***Claim Rejections - 35 USC § 102***

22. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

23. Claims 1–2 are rejected under 35 U.S.C. 102(e) as being anticipated by  
Tonooka, Mitsuhiro (Tonooka hereinafter), U.S. Patent 7,002,575.

24. As to claim 1, Tonooka discloses an analytical shell-model producing apparatus (see “shell-model producing apparatus” as “design supporting apparatus” in col. 3, lines 34–37 and Fig. 1, item No. 10), for converting a configuration model produced by a three-dimensional configuration modeler into an analytical shell-model for numerical analysis, comprising: a reference-plate thickness size inputting means for inputting a reference-plate thickness size to be used when specifying a thin-plate portion from the configuration model (see “reference-plate thickness size” as “graphical elements” and “inputting means” as “assigned by assignment operations by an operator” in col. 3, lines 47–51 and Fig. 1, item No. 14); and means for making two (2) surfaces, being narrower therebetween than the reference-plate thickness size, which is inputted from said reference-plate thickness inputting means, in a pair of surfaces (see “making two (2)

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surfaces" as "a feature" in col. 3, lines 57–60 and Fig. 1, item No. 18), producing an offset-surface between the pair of surfaces, and producing an internal-surface model by seaming on an outer periphery portion of the offset-surface (see "offset-surface" as "edition face", "between the pair of surfaces" as "between two graphical elements", "internal-surface" as "shell", and "seaming on an outer periphery portion" as "forming a shell on a two-dimensional drawing" in col. 4, lines 44–58 and Fig. 2, item Nos. S7–S10).

25. As to claim 2, Tonooka discloses the analytical shell-model producing apparatus further comprising means for producing a thickness attribute of said internal-surface model from face-to-face distance between the surfaces of said pair and a value of the plate thickness (see "face-to-face distance" as " $P_0$ " to " $P_1$ " in col. 4, line 65 to col. 5, line 14 and Fig. 5).

### ***Claim Rejections - 35 USC § 103***

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

27. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

28. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

29. Claims 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tonooka taken in view of Kawaguchi et al., (Kawaguchi hereinafter), U.S. Patent 7,038,700.

30. As to claim 3, Tonooka discloses an analytical shell-model producing apparatus for converting a configuration model produced by a three-dimensional configuration modeler into an analytical shell-model for numerical analysis (see "shell-model producing apparatus" as "design supporting apparatus" in col. 3, lines 34–37 and Fig. 1, item No. 10), comprising: a reference-plate thickness inputting means for inputting a reference-plate thickness size to be used when specifying a thin-plate portion from the



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configuration model (see “reference-plate thickness size” as “graphical elements” and “inputting means” as “assigned by assignment operations by an operator” in col. 3, lines 47–51 and Fig. 1, item No. 14); a pair-surfaces acknowledging means for acknowledging two (2) surfaces, being equal or less than the reference-plate thickness size (see “making two (2) surfaces” as “a feature” in col. 3, lines 57–60 and Fig. 1, item No. 18), which is inputted by said reference-plate thickness inputting means, in face-to-face distance between the arbitrary two (2) surfaces constructing the configuration model (see “face-to-face distance” as “ $P_0$ ” to “ $P_1$ ” in col. 4, line 65 to col. 5, line 14 and Fig. 5); a top/bottom side rib attribute acknowledging means for acknowledging the pair-surfaces acknowledged by said pair-surfaces acknowledging means to be one of a top side surface, a bottom side surface, and a rib surface (see “top side surface and a bottom side surface” as “a feature” in col. 3, lines 57–60 and Fig. 1, item No. 18); an offset-surface producing means for producing an offset-surface by offsetting a group of surfaces on either the top side or the bottom side, which are acknowledged by said top/bottom side rib attribute acknowledging means, and the rib surface, respectively, (see “offset-surface” as “edition face” in col. 4, lines 44–58 and Fig. 2, item Nos. S7–S10) in direction of a normal line towards the inside of the configurations thereof; a seam-surface producing means for seaming between the offset-surface, which is produced from either the top or the bottom surface by means of said offset-surface producing means, and also the offset-surface produced from the rib surface (see “offset-surface” as “edition face” and “seam-surface producing means” as “forming a shell on a

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two-dimensional drawing” in col. 4, lines 44–58 and Fig. 2, item Nos. S7–S10); and an internal-surface producing means for registering the offset-surface seamed by said seam-surface producing means, as in a form of an internal-surface model (see “offset-surface” as “edition face” and “internal-surface” as “shell” in col. 4, lines 44–58 and Fig. 2, item Nos. S7–S10).

31. While Tonooka discloses an analytical shell-model producing apparatus, Tonooka fails to disclose a side rib attribute acknowledging means for acknowledging a rib surface.

32. Kawaguchi discloses a side rib attribute acknowledging means for acknowledging a rib surface. (See col. 8, lines 53–58, and Fig. 9A).

33. Tonooka and Kawaguchi are analogous art because they are both related to CAD/CAE software.

34. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the acknowledging of a rib surface of Kawaguchi in the system of Tonooka because Kawaguchi develops a morphing method of a structure shape, which can quickly and easily acquire the FEM model of a structure to be analyzed using that of a prototype structure (see col. 2, lines 38–42), and as a result, Kawaguchi reports the following improvement over his prior art: ability to design a new vehicle as a derived vehicle based on existing vehicle models, which are usually stored already in a database, (see col. 2, lines 25–36).

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35. As to claim 5, Kawaguchi discloses a dialog top/bottom side rib attribute amending means for amending the top side surface, the bottom side surface and the rib surface, which are acknowledged by said top/bottom side rib attribute acknowledging means, in a manner of dialog. (See col. 13, lines 9–16, and Fig. 10, item No. 101).

36. As to claim 6, Tonooka discloses wherein said internal-surface model producing means calculates the plate thickness on each of the internal-surface models as targets from the face-to-face distance between two (2) surfaces of the pair, and wherein this calculated plate thickness is set as the thickness attribute of the internal surface model of the target (see “face-to-face distance” as “ $P_0$ ” to “ $P_1$ ” and “plate thickness” as “shell thickness,  $d$ ” in col. 4, line 65 to col. 5, line 14 and Fig. 5).

37. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tonooka taken in view of Kawaguchi as applied to claim 3 above, and further in view of Mobley et al. (Mobley hereinafter), An Object Oriented Approach to Geometry Defeaturing for Finite Element Meshing.

38. As to claim 4, while the Tonooka–Kawaguchi apparatus teaches almost all of the instant invention as applied to claim 3 above, the Tonooka–Kawaguchi apparatus lacks emphatic displaying means for displaying the top side surface, the bottom side surface and the rib surface, which are acknowledged by said top/bottom side rib attribute acknowledging means, with making emphasis thereon.

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39. Mobley discloses a top/bottom rib attribute emphatic displaying means for displaying the top side surface, the bottom side surface and the rib surface, which are acknowledged by said top/bottom side rib attribute acknowledging means, with making emphasis thereon (see Fig. 11 in page 560 and Fig. 13 in page 561). Examiner notes that both Fig. 11 and Fig. 13 show “emphatic displaying” as “highlighting” in the original pdf file, even though highlighting is not noticeable in the printout of the original pdf file.

40. Tonooka, Kawaguchi, and Mobley are analogous art because they are both related to CAD/CAE software.

41. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the emphatic displaying means of Mobley in the Tonooka–Kawaguchi apparatus because Mobley presents an object-oriented approach to automatic geometry defeaturing to overcome accuracy deficiencies and to remove excessive detail in CAD data (see page 547, lines 3–5), and as a result, Mobley reports the following two improvements over his prior art: a framework for automatically meshing real world 3D CAD models with tetrahedral, which recognizes undesirable features in CAD models that can make meshing fail, give poorly shaped elements, or give too many elements; and two types of defeaturing: geometry-based defeaturing and FE (finite element) model-based defeaturing, which reduce model size and increase mesher robustness. In addition, Mobley illustrates the advantages of using data abstraction to represent not only the CAD geometry and topology but the finite element model as well (see page 562, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs).

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***Response to Arguments***

42. Applicant's arguments filed 1/3/07 have been fully considered but they are not persuasive.

43. Regarding the specification objections, the amendment corrected all deficiencies and the objections are withdrawn.

44. Regarding the claim objections, the amendment to the claims corrected most deficiencies, however claim objections remain.

45. Regarding the rejections under 112, deficiencies remain.

46. Regarding the rejections under 101, Applicant's arguments have been considered but they are not persuasive. Claim rejections remain.

47. Regarding the rejection under 102, Applicant's arguments have been considered, but they are not persuasive.

48. Applicant argues, (see page 12, 4<sup>th</sup> paragraph), that "Tonooka is limited to two-dimensional drawings". (See "technique for reducing an amount of work required to input dimensions of graphical elements in CAD systems in which three-dimensional shapes are created" in col. 1, lines 12–14).

49. Applicant argues, (see page 12, 4<sup>th</sup> paragraph), that "Tonooka does not produce an internal surface (see Tonooka "in step 7 through step 10, processing when the feature type is a shell is executed. That is, in step 7, an edition face of the basic feature to which a shell, being a feature, is added" in col. 4, lines 44–47), and does not

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associate a thickness (see Tonooka "In step 9, a subroutine is called for calculating a thickness (linear dimension) of the shell" in col. 4, lines 51–52) as an attribute of the internal surface".

50. Applicant argues, (see page 12, last paragraph to page 13, 1st paragraph), that "Kawaguchi does not produce an internal surface (see Tonooka "in step 7 through step 10, processing when the feature type is a shell is executed. That is, in step 7, an edition face of the basic feature to which a shell, being a feature, is added" in col. 4, lines 44–47), and does not associate a thickness (see Tonooka "In step 9, a subroutine is called for calculating a thickness (linear dimension) of the shell" in col. 4, lines 51–52) as an attribute of the internal surface".

51. Applicant argues, (see page 13, 2<sup>nd</sup> paragraph), that "Mobley does not produce an internal surface (see Tonooka "in step 7 through step 10, processing when the feature type is a shell is executed. That is, in step 7, an edition face of the basic feature to which a shell, being a feature, is added" in col. 4, lines 44–47), and does not associate a thickness (see Tonooka "In step 9, a subroutine is called for calculating a thickness (linear dimension) of the shell" in col. 4, lines 51–52) as an attribute of the internal surface".

52. Therefore it is the Examiners position that the cited references do anticipate the claims and the rejections are maintained.

### ***Conclusion***

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53. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

54. Examiner would like to point out that any reference to specific figures, columns and lines should not be considered limiting in any way, the entire reference is considered to provide disclosure relating to the claimed invention.

55. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan C. Ochoa whose telephone number is (571) 272-2625. The examiner can normally be reached on 7:30AM - 4:00 PM.

56. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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57. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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2/6/07



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2/7/07